HERBICIDES FOR WEED CONTROL IN COLE CROPS, 2001

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Interpretative Summary

All plots treated with herbicides including the cultivated check had between 66 - 100 % weed control. Six weeks post transplant, plots treated with the two high rates of Pyridate, Sulfentrazone, Clomazon, and Carfentrazone Ethyl had significantly less weeds than any other treatment. Five weeks post application of Carfentrazone Ethyl , all plants (broccoli, cauliflower, and cabbage) were dead from herbicide injury.

Introduction

Cole crops such as Cauliflower, Broccoli and Cabbage are widely grown in Tennessee for fresh market usage. Cabbage acreage has expanded in recent years as an alternate crop to tobacco. However, the cabbage-worm complex which includes the imported cabbageworm and cabbage looper can destroy the crop rather quickly with constant pressure during the growing season. Insect control incorporating good Integrated Pest Management Strategies should be implemented for a successful cabbage crop. Cabbage, a cool season crop, is best grown in the spring or fall as the summer season is usually too severe for satisfactory cabbage production. Production of marketable cole crops require implementation of optimum cultural techniques. Weed control is necessary for high yields and quality. The number of herbicides for weed control in cole crops is rather limited. Several herbicides are labeled for use on cole crops, but none control all weeds adequately. Most of the herbicides do not control several of the problem weeds found in Tennessee. In 2001, an experiment was conducted at the University of Tennessee Plateau Experiment Station near Crossville to evaluate phytotoxicity and efficacy of selected herbicides for use in cole crops.

Materials and Methods

Transplants of broccoli (Pack Man), cabbage (Stone Head), and cauliflower (Snow Crown) were set on 13 Sep at The University of Tennessee Plateau Experiment Station, Crossville. Plots were 3 rows wide with one crop in each row by 10ft long. Plants were set 12 inches apart and rows were planted on 3 ft centers. Treatments were arranged in a randomized complete block design with four replications. Blocks were separated by 5ft alleys. Soil type was classified as Lily sandy loam with a pH 6.2. Clomazone herbicide was applied PPI on 13 Sep. Pendimethalin and Dimethenamid - P were applied post transplant , pre-emergence to weeds, on 3 Oct. All other herbicides including the cultivated check were applied 4 weeks post transplant on 9 Oct. All applications were made using a 2.5 gal compressed CO_2 hand sprayer calibrated to spray 60.5 gpa at 40psi. Normal cultural practices were maintained during the growing season. Weed population consisted of a high population of Purslane, a moderate population of common ragweed

and smart weed , and a ver low population of carpet weed, pigweed, carpet weed and grasses. Crop injury or phytotoxicity was rated from 0 = no injury to 10 = sever symptoms of

burning, yellowing, crinkling, and death of plant on 29 Oct and 15 Nov. Due to the lateness of the crop, yields were not taken. All data were subjected to ANOVA.

Results and Discussion

All plots treated with a herbicide including the cultivated check had weed control varying from 66 to 100 % control. The cultivated check plots had about 71 % weed control 5 weeks post treatment. Plots treated with Pyridate (.5 & 1.0 lb (ai)/A), and Sulfentrazone had fewer weeds 5 weeks post treatment than any other treated plot. Clomazone herbicide was phytotoxic to Cauliflower producing yellowing of leaves and still was apparent 8 weeks post treatment. Carfentrazone Ethyl was phytotoxic to all three crops which ultimately killed the plants of the three crops 5 weeks post treatment. Dimethenamid - P and Pendimethalin herbicides did not produce any evident injury to any of the crops. Pyridate, Clomazon, Pendimethalin, and Dimethenamid - P herbicides did not produce any injury to cabbage. Both rates of Sulfentrazone produced moderate to severe crop injury on cabbage, broccoli, and cauliflower.

Table 1. Effect of herbicides on crop injury/phytotoxicity on cole crops at The University of Tennessee Plateau Experiment Station at Crossville, 2001.

Treatment and Rate lb(ai)/A	PHYTOTOXICITY RATING (0 - 10) Leaf Burning, Yellowing, or Crinkling CABBAGE CAULIFLOWER BROCCOLI					
	29 Oct	15 Nov	29 Oct	15 Nov	29 Oct	15 Nov
Weedy Check.	0.00	0.00	0.00	0.00	0.00	0.00
Cultivated Check	0.00	0.00	0.00	0.00	0.00	0.00
Pyridate 5EC 1.00	2.25	0.00	6.00	6.00	5.88	5.75
Pyridate 5EC 0.50.	0.00	0.00	7.63	8.25	2.50	1.75
Pyridate 5EC 0.25 ..	0.00	0.00	5.38	5.75	3.50	2.88
Sulfentrazone 4FL 0.375 .	8.25	7.63	8.00	7.75	8.25	7.75
Sulfentrazone 4FL 0.1875	8.13	8.13	7.25	7.00	8.38	8.00

Clomazone 4EC 0.25	0.00	0.00	8.00	8.00	0.00	0.00
Carfentrazone Ethy/ 40WP 0.10	9.75	10.00*	9.75	10.00*	9.63	10.00*
Pendimethalin 3EC 1.00	0.00	0.00	0.00	0.00	0.00	0.00
Dimethenamid 6EC 0.66 .	0.00	0.00	1.00	0.00	0.00	0.00
Dimethenamid 6EC 0.66..	0.00	0.00	1.00	0.00	0.75	0.00
LSD (P=0.05)	**0.39**	**0.32**	**0.43**	**0.54**	**0.51**	**0.56**

* All plants were dead on this evaluation date

Table 2. Effect of herbicide treatment on weed control in cole crop herbicide trials at The University of Tennessee Plateau Experiment Station at Crossville.

Treatment and Rate lb(ai)/A	% WEED CONTROL Purslane Common Ragweed Smart Weed					
	29 Oct	15 Nov	29 Oct	15 Nov	29 Oct	15 N
Weedy Check.....	0.00	0.00	0.00	0.00	0.00	0.0
Cultivated Check.....	92.50	71.25	92.50	72.00	70.50	92.0
Pyridate 5EC 1.00 ..	98.75	96.25	98.75	96.50	97.00	97.2
Pyridate 5EC 0.50 .	97.50	96.25	97.50	96.00	97.50	96.7
Pyridate 5EC 0.25 .	81.25	76.25	81.25	75.00	81.50	82.5
Sulfentrazone 4FL 0.*375*	100.00	100.00	100.00	100.00	100.00	100.0
Sulfentrazone 4FL 0.1875	98.75	97.50	100.00	98.00	100.00	97.7
Clomazone 4EC 0.25...	100.00	87.50	100.00	85.00	100.00	84.0
Carfentrazone Ethy/ 40WP 0.10	97.50	87.50	98.50	88.00	97.75	86.5
Pendimethalin 3EC 1.00	92.50	88.75	92.00	89.25	92.50	87.5

Dimethenamid 6EC 0.66	86.25	66.25	86.00	64.50	85.00	63.50
Dimethenamid 6EC 1.25	100.00	86.25	100.00	85.50	100.00	100.00
LSD (P=0.05)	**4.53**	**6.37**	**4.63**	**6.28**	**4.48**	**6.48**

This research represents one season's data and does not constitute recommendations. After sufficient data is collected over the appropriate number of seasons, final recommendations will be made through research and extension publications.